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Full Length Research

INTEGRATING MANAGEMENT SYSTEMS TO ENHANCE ORGANIZATIONAL PERFORMANCE IN SOME SELECTED OIL AND GAS COMPANIES IN PORT HARCOURT NIGERIA

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The study investigates the integration of three popular management systems in the Nigeria oil and gas industry and how organizational performance can be enhanced. The management systems are Quality Management System (QMS), Environmental Management System (EMS) and Occupational Health and Safety Management System (OHS-MS). Findings are expected to assist managers in oil and gas companies to have an overview and take advantage of an integrated management system to assure their organization for sustained growth and enhanced performance through continual improvement. Cross-sectional survey method of research design was used. The population consisted of 2521 senior staff of five (5) selected oil and gas companies in Port Harcourt. A sample size of 500 respondents was drawn yielding more than 85% rate of return. Data collected from the field were analysed with descriptive and Pearson Product Moment correlation statistical tools. Findings showed that QMS and OHS-MS correlated positively with customer satisfaction and organizational efficiency yielding respective high coefficients of (0.780, 0.846 and 0.668, 0.703), while, EMS correlations with the dependent variables were fund yielding low coefficients of (0.316, 0.220); however all were found to be significant. With integration of the management systems, staff are more easily able to provide satisfactory service and quality products to customers; organizations understand the important relationship between industrial hazards and health and the safety of their staff; and management can chart new directions to be more environmentally sustainable. Oil and gas sector will benefit greatly in terms of cost saving, efficient utilization of resources, and proper time management if they tour the path of integrating their management systems.

Keywords: Integration, Quality, Health, Safety and Environmental (QHSE) management systems, integrated management audit, organizational performance.

INTRODUCTION

Background of the Study

Over the last couple of decades, organizations, both large and small have been influenced by customers, regulators, industries, and internal motivators to implement quality, health and safety, and environmental (QHSE) management systems. Though each one can act as a standalone

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management system, and operate separately, however, because they all share a set of common features, there is unquestionable benefit in managing them in an integrated fashion. It has been proven that it is difficult to deal with separate management systems covering quality, environment and occupational health and safety, and ensuring that they align with the organisational strategy (Wilkinson and Dale, 1998). Due to this circumstance, Integrated Management System (IMS) has drawn the attentions of both academics and practitioners.

An Integrated Management System (IMS) is a management system, which integrates all components of a business into one coherent system so as to enable the achievement of its purpose and mission (Matias and Coelho, 2002). In the present study, the IMS focuses on the integration of ISO 9001 for Quality Management System (QMS), ISO 14001 for Environmental Management System (EMS) and OHSAS 18001 for Occupational Health and Safety Management System (OHS-MS). It is hereby hypothesized that an effectively implemented integrated management system aligns policy with strategic objectives and eventually leads to organizational performance.

This assertion has been supported in literature by Holdsworth (2003), Suditu (2007), Simon et al., (2011, 2013) and De Oliveira (2013). Holdsworth (2003) maintained that, organisation must consider QHSE when making decisions, otherwise conflict and ineffective uses of resources will occur. Simon et al., (2011) pointed to the fact that integration of QHSE Management systems promotes synergies and cost savings, as well as a reduction of time spent when managing the systems. According to Suditu (2007), for organisation that want to survive and compete in the global market, it is necessary to continually improve performance through effective management of their various systems.

Statement of the Problem

QHSE activities/programmes are closely related and inter-dependent, there are number of “overlaps” that would be encountered during the implementation process. Such overlaps can become problematic and interfere with the organisation’s business process, unless appropriately addressed. It can result in ineffective management and ultimately leading to higher operating costs. The rational approach is, therefore, to integrate the discipline of QHSE into a single management system. Another problem identified in this research is that in spite of the many benefits of integration on organizational performance, there is not a well-documented evidence of the practice of integration in the oil and gas sector in Nigeria. Hence this study aims to contribute to literature in this regard by investigating integrating management systems in the oil and gas sector in Nigeria.

Aim, Objectives and Research Questions

The main aim of this study therefore is to investigate the extent to which the integration of QHSE management systems influenced organizational performance in the oil and gas sector in Nigeria, and this is achieved by pursuing the following objectives: to determine the extent oil and gas firms integrate their QHSE management systems; to ascertain the effect of integration on organizational performance. To achieve these objectives this research would provide answers to the following questions: How effective do oil and gas firms integrate their management systems? What is the relationship between integrated management system and organizational performance?

Hypotheses

In the course of this research work, the following hypotheses were tested.

Ho1: There is no significant relationship between QMS integration and customer satisfaction.

Ho2: There is no significant relationship between EMS integration and customer satisfaction.

Ho3: There is no significant relationship between OHS-MS integration and customer satisfaction.

Ho4: There is no significant relationship between QMS integration and organisational efficiency.

Ho5: There is no significant relationship between EMS integration and organisational efficiency.

Ho6: There is no significant relationship between OHS-MS integration and organisational efficiency.

Figure 1, below depicts the researcher’s concept of the relationship between integration of the three management systems and organizational performance as measured by customer satisfaction and organizational efficiency.

Significance of the Study

The importance of this research hinges on the fact

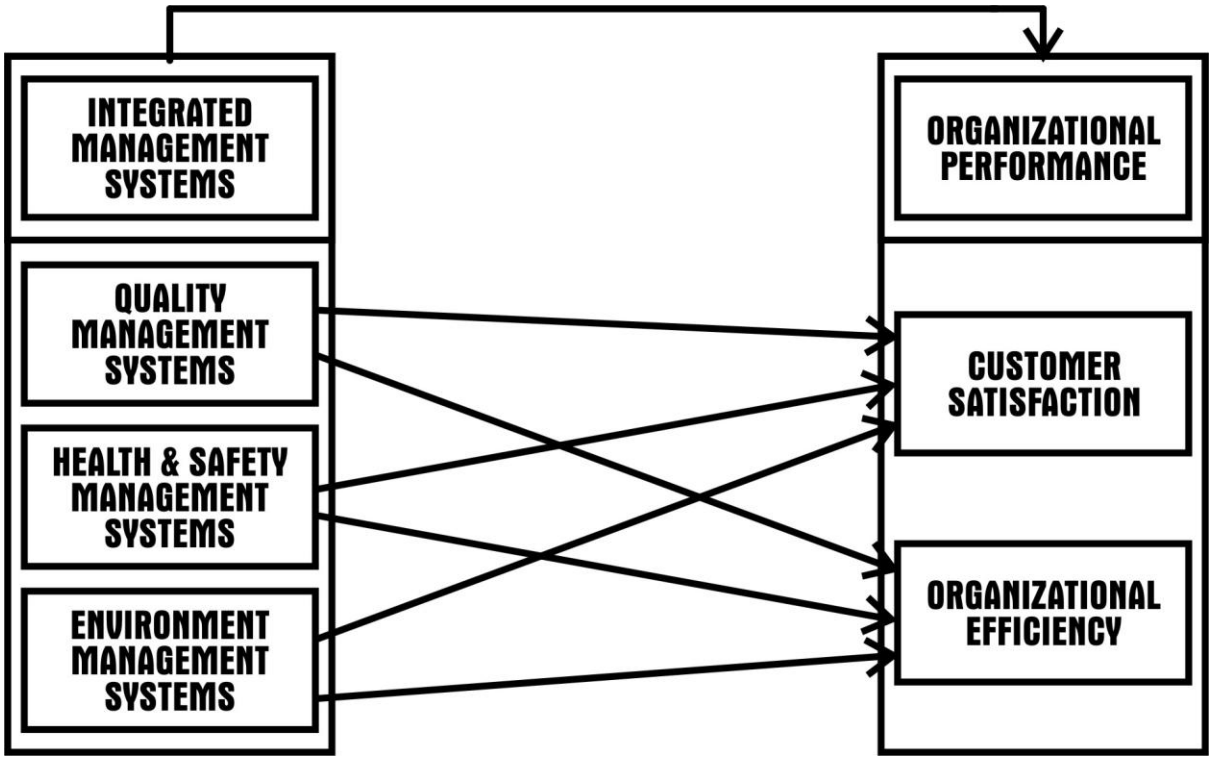

Figure 1. Conceptual framework of the operational relationship between individual management systems integration and organizational performance as measured by customer satisfaction and organizational efficiency.

that little is known about integrated management systems in Nigeria. A search of literature comes up with articles covering integrated management systems and organizational performance for foreign (outside Nigeria) organizations. Therefore, this paper will serve invaluable to the manager in the Nigerian oil and gas sector. The main contribution of this research therefore is to ascertain how oil and gas firms in Nigeria carry out the integration process and how this affected their organizational performance vis-à-vis customer satisfaction and organizational efficiency.

The remainder of the paper highlights literature on organizational performance, quality management system based on the ISO 9001 framework, ISO 14001 for Environmental Management System, and OHSAS 18001 for Occupational Health and Safety Management System. Benefits and challenges of integration are outlined; followed by a description of the research methods and procedures used in the study. The results of our enquiry are then discussed. Finally, recommendations and directions for future research are offered.

Organizational Performance

The nature of organizational performance and its measurement has been a topic for both scholars and practitioners since organizations were first formed. How to determine organizational performance, if the efforts of the organization are being put to their best use and are achieving the desired outcomes is at the heart of several disciplines. Accountants devote their attention to fairly presenting the historical financial performance of organizations, while the management disciplines focus on how to improve current and future organizational performance. More specifically, for the purposes of management research, and in particular for integrated management systems, post hoc performance may be measured to determine the effectiveness of the managerial decisions based on level of compliance to implemented management system standards.

Organizational performance can be evaluated by many different perspectives resulting in many different interpretations of “successful performance”.

Each of these perspectives of organizational performance can be argued to be unique. Further, each organization has a unique set of circumstances, making performance measurement inherently situational (Cameron and Whetton, 1981). Therefore, this research will attempt to present a unified perspective of overall organizational performance as appropriate in the context of integrated management systems for oil and gas companies.

According to Mitchell (2002), organizational performance can be viewed from four dimensions – relevance, effectiveness, efficiency, and financial viability. Customer-perception of relevance and efficiency are the two views which this research focuses on as measures of organizational performance. Juran (1991) defined customer satisfaction as 'the result achieved when service or product features respond to customer needs and when the company meets or exceeds customers' expectations over the lifetime of a product or service. While Mitchell (2002) defined relevance as the degree to which the organization's stakeholders (customers, employees, and shareholders) think the company is relevant to their needs. Mitchell (2002) offered that efficiency is the dimension which measures how well the organization uses its resources (financial, human, physical, and information). A high level of integration of standard management systems is expected to result in high customer satisfaction and organizational efficiency, leading to organizational performance.

Management Systems (MS)

According to ISO 9000: 2005, a MS is a mutually related set of elements which interact with each other in order to establish the policy and objectives and to achieve these objectives.

Depending on the type of results and objectives which guide the management system, different types of system can be distinguished including:

i. Quality Management System (QMS): a management system to control organization with regard to quality, which is to meet customer's expectation and needs with products that fulfil their requirements (ISO, 2005).

ii. Environmental Management System (EMS): a system to manage and control an organization with respect to the environment that is to achieve good results in a social context through a good environmental behaviour (ISO, 2012).

iii. Occupational Health and Safety at Work Management System (OHS-MS): a system to manage and control an organization with respect to safety and health at work, to achieve good results regarding the relationship with the workers by eliminating or minimizing occupational hazards and damages (AENOR, 2012).

To implement these MSs, many organizations register to reference standards such as ISO 9001, ISO 14001 and OHSAS 18001, among others, to help them establish document and maintain their MSs in a structured and systematic way.

The Case for Integrated Management System

An Integrated Management System (IMS) is a management system, which integrates all components of a business into one coherent system so as to enable the achievement of its purpose and mission (Matias and Coelho, 2002). The topic of MSs Integration started to appear in the literature more than fifteen years ago (Beechner and Koch, 1997; Wilkinson and Dale, 1998). Studies such as the ones from Hoyle (1996) and Powley (1996) analysed the differences and commonalities between the ISO 9001 and ISO 14001 Standards. Some research studies examined the ways in which individual organizations have addressed the introduction and integration of environmental management systems (EMSs) and occupational health and safety management systems (OHS-MSs) with their quality management system (QMS) (Hillary, 1993). Other investigations exist on how organization have chosen to integrate their MSs focusing on different topics such as their integration methodologies degrees as well as the advantages and challenges of the integration (Karapetrovic and Willborn, 1998a, Karapetrovic and Jonker, 2003; Zeng et al., 2007; Bernardo et al., 2009).

The integration of MSs refers to the action and the effect of combining or merging the elements of individual MSs. This implies that organizations need to take action for sharing tools, methodologies, and systematic management of different areas, and to comply with the different standards or model governing the management, system. For example, when firms integrate quality, environmental and occupational health and safety, it is possible to identify several common elements that can be coupled or fused, in the following ways.

In view of this, we can see how the areas of quality management, environmental management

and occupational health and safety management have many commonalities, including:

i. The existence of common management principle or fundamentals (process-based approach, focus on achieving results and continual improvement).
ii. A similar structure in the standards, based on the continual improvement cycle, the Plan, Do, Check, Act (PDCA).
iii. The existence of similar requirements (in some cases, almost identical), which can be addressed seamlessly.

These three standards contain the same basic principle and a general common structure (Fresner and Engelhardt, 2004). They all require the definition of roles and responsibilities, to train personnel, to define written procedures, to control and keep records of documentation and data, to continuously improve and to perform internal audits (Wright, 2000; Zeng et al., 2007).

According to Jorgensen et al., (2004) about 80% of the work is common to all three disciplines: quality, environment and occupational health and safety. The similarities between these management systems refer to:

i. Top management commitment.
ii. Documentation and records control.
iii. Definition of a policy.
iv. Planning of objectives and targets.
v. Procedures for training of employees.
vi. Communication procedures.
vii. Audits.
viii. Control of non-compliance.
ix. Corrective and preventive actions.
x. Management review.

In this sense, companies that have different standards to comply with are likely to increase their costs from extensive paperwork and confusion between demands of the individual standards. From a management system point of view, it would be more appropriate to merge these three management systems into one system, because it reduces duplicate work and bureaucracy (Jorgensen et al., 2004).

MATERIALS AND METHODOLOGY

Methodology was based on the cross-sectional survey method of research design since the population for this study resided in different organizations. The target population was senior staff of some selected five oil and gas companies located in Rivers State, Nigeria. The companies are Shell Petroleum Development Company Limited (SPDC), Dresser Rand Nigeria Limited (DRNL), Nigerian Liquefied Natural Gas (NLNG), Adax Petroleum Development Company Ltd (APDC), and Chevron Nigeria Limited (CNL). These firms were chosen because they use all the three management systems standards. Also, it is found that they have kept an updated record of the process of integration and were willing to participate in the research project. In all, the total of five companies provided a population size of Two thousand, five hundred and twenty-one (2521) senior staff which was considered for this study.

The population elements for this study consisted of General Managers, Technical/Departmental Managers, Engineers (Process/Mechanical/Electrical), HSE Officers, Project Planner/Project Managers and Supervisors. A sampling method used in this study is simple random method among the senior staff. Using Taro Yamane (1967), a sample size of 500 was determined, therefore 500 questionnaires were distributed. The questionnaire contained two parts – integrated management systems and organisational performance. Integrated management system was divided into quality management system, environment management system, and health and safety management system while operational efficiency and customer satisfaction were used to measure organizational performance.

The questionnaire served to elicit responses on the extent of integration for the three management systems as practiced in each firm and also provided insight as to how they perceived customer satisfaction and operational efficiency. Reliability scores of 0.731 and 0.863 was achieved for management systems integration and organizational performance, and as the figures are well above the threshold of 0.70, the instruments were considered consistent and reliable. Responses were analysed with frequency, mean, percentages, and Pearson Product Moment correlation coefficient statistical tools using SPSS statistical software package. Questions were rated based on a 5-point Likert scale to measure responses for the aforementioned variables which puts the mid-point at a mean rating score of 3 (1 = To no extent; 2 = Small extent; 3 = Moderate extent; 4 = Large extent; and 5 = Great extent).

Table 1. Distribution of respondents in the organizations.

Name of Company	Frequency	Percent (%)
Shell Petroleum Devt. Coy Ltd	154	36.1
Dresser Rand Nigeria Limited	51	11.9
Nigeria Liquefied Natural Gas	162	37.9
Adax Petroleum Development Company Ltd	32	7.5
Chevron Nigeria Limited	28	6.6
Total	**427**	**100**

Source: Field Survey, 2016.

Table 2. Position of respondents in the organizations.

Position in organization	Frequency	Percent (%)
General Manager	23	5.4
Technical/Departmental Manager	62	14.5
Engineer (Process/Mechanical/Electrical)	104	24.4
Project Planner/Project Manager	86	20.1
Supervisor	152	35.6
Total	**427**	**100**

Source: Field Survey, 2016.

Table 3. Department of respondents in the organizations.

Department	Frequency	Percent (%)
Administration	44	10.3
Accounts	29	6.8
Engineering	104	24.4
Procurement	69	16.2
Production	113	26.5
Health, Safety and Environment (HSE)	68	15.9
Total	**427**	**100**

Source: Field Survey, 2016.

RESULTS

A return rate of more than 85% resulted in exactly 427 usable questionnaires indicating sufficiency of this number in making general conclusions. Extracted data gathered were prepared and used to answer the research questions and hypotheses. Tables 1 to 3, presents frequency and percentages with respect to participating organizations, position and department of respondents.

Table 1 shows the distribution of respondents in percentages in the five selected companies, Shell Petroleum Development Company have a frequency of 154 and 36.1%, Dresser Rand Nigeria Ltd have a frequency of 51 and 11.9%, Nigeria Liquefied Natural Gas have a frequency of 162 and 37.9%, Adax Petroleum Development Company Ltd have a frequency of 32 and 7.5% and Chevron Nigeria Ltd

Table 4. Extent of Integration for QMS.

Questions	Mean	Std. Deviation
Integration has resulted in high quality thereby reducing costly problems associated with non-integration	3.2693	1.35316
Integration helps us provide satisfactory services and quality products to customers	3.363	1.38294
High level of integration has helped eased the different processes that come together to produce valid and reliable results	3.2436	1.3964
I perceive that our goods and/or services meet and/or exceed customer expectations in a consistent manner due to integration	3.3115	1.38195
My company views continual quality improvement as a strategic objective and is high on senior management agendas	3.2248	1.36042

Source: Field Survey, 2016.

have a frequency of 28 and 6.6%, given a total respondents of 427 with a corresponding 100% respectively.

Table 2 shows the position of respondents in the organisations, General Manager have a frequency of 23 and 5.4%, Technical/ Departmental Manager have a frequency of 62 and 14.5%, Engineer (Process/ Mechanical/ Electrical) have a frequency of 104 and 24.4%, Project Planner/ Project Manager have a frequency of 86 and 20.1% and Supervisor have a frequency of 152 and 35.6%, given a total respondents of 427 with a corresponding 100% respectively.

Table 3 shows the department of respondents in the organisations, Administration have a frequency of 44 and 10.3%, Account have a frequency of 29 and 6.8%, Engineering have a frequency of 104 and 24.4%, Procurement have a frequency of 69 and 16.2%, Production have a frequency of 113 and 26.5% and Health, Safety and Environment have a frequency of 68 and 15.9%, given a total respondents of 427 with a corresponding 100% respectively.

Extent of Integration of QMS, EMS, and OHS-MS

To answer the question of how effective oil and gas firms integrate their management systems senior management staff responded to questions as captured in Tables 4 through 6.

Table 4 shows that respondents' perception or observation of quality management system standard yielded an overall mean rating score of 3.328 (which is interpreted to mean that organizations' integration of quality management system standard is high since it is above the threshold of 3). The instrument that contributed the most to this overall score was an agreement that Integration helps them provide satisfactory services and quality products to customers and the least contributory was that, their company views continual quality improvement as a strategic objective and is high on senior management agendas each rated 3.363 and 3.225 respectively. Table 5 shows level of compliance for health and safety management system standard in oil and gas companies in Rivers State. Study found that senior staff's perception or observation of health and safety standard management system standard resulted in an overall mean rating score of 3.129 (which is interpreted to mean that the compliance for this standard is also high since it is above the 3 threshold). The instrument that contributed the most to this overall score recorded a high 3.194 where senior staff agreed that their organization understand the important relationship between industrial hazards and health & safety hence the decision to integrate. The lowest of 3.075 is recorded for the response that the integration of health and safety standard makes it easier for ordinary staff to file complaints. Table 6 above shows that environment management system standard yielded an overall mean rating score of 2.894 (which is interpreted to mean that respondents have perceived that level of integration for environment standards was not commendable since it is below the 3 threshold). However, the

Table 5. Extent of Integration for OHS-MS.

Questions	Mean	Std. Deviation
The integration of health and safety makes it easier for ordinary staff to file complaints	3.0749	1.51642
My organization understand the important relationship between industrial hazards and health and safety hence the decision to integrate	3.1944	1.42155
I perceive that integration has improved the level of communication to all employees of industrial hazards	3.1546	1.45011
Systems integration has increased my company's compliance to ergonomic standards designed to address musculoskeletal injuries	3.089	1.38623
My organization bears at least 80% of the cost for the maintenance of staff health and safety	3.1311	1.43453

Source: Field Survey, 2016.

instrument that contributed the most to this overall score recorded 3.096 with respondents agreeing that Systems integration have enhanced the operations of their organization to be more environmentally sustainable. The lowest of 2.658 is recorded for the response that the level of their organization's compliance with applicable environmental legislation and regulation is low. This low rating score clearly shows that on the overall, oil and gas firms have a low level of compliance to environmental regulation.

Relationship between Management Systems Integration (MSI) and Organizational Performance

Table 7 below shows a correlation matrix of the correlation coefficients between dimensions of Management systems integration (QMS, OHS-MS and EMS), and measures of organizational performance, customer satisfaction, and organizational efficiency. Quality management system correlated with customer satisfaction and organizational efficiency yielding respective positive coefficients of 0.798 and 0.846, which were found to be high and significant. Health and safety management system correlated with customer satisfaction and organizational efficiency yielding respective correlation coefficients of 0.668 and 0.703, which were also high and significant. Environment management system correlated with customer satisfaction and organizational efficiency yielding respective correlation coefficients of 0.316 and 0.220, which were found to be low but significant.

DISCUSSIONS

The main objective of this study was to determine how companies integrate standard management systems to enhance organizational performance using Rivers State as the study location. Respondents were senior staff mainly in the departments of Engineering, Procurement, Production, and Health, Safety and Environment (HSE) and majority of male. Research revealed that respondents have a good knowledge of integrated management systems.

There is high level integration of two of the three standard management systems explored in this research. These are quality management system and health and safety management system. The level of integration for environment standard management system was low because it was below the benchmark used for measurement. Senior staff perceived or observed high levels for customer satisfaction and organizational efficiency. All of the six hypotheses were significant, and all but two had high correlation coefficients. Because of its low standard, environment management correlated poorly with the two dimensions of the dependent variable. This is a clear indication that oil and gas firms in Rivers State may have neglected their duty

Table 6. Extent of Integration for EMS.

Questions	Mean	Std. Deviation
Environmental liability from losses due to environmental pollution have been reduced because of integration	2.8525	1.47412
Systems integration have enhanced the operations of my organization to be more environmentally sustainable	3.096	1.46882
My organization is committed to continual improvement of the environment during integration	2.9016	1.41078
The level of my organization's compliance with applicable environmental legislation and regulation is high	2.6581	1.38747
Our approach to environmental management integration adopts the Plan-Do-Check-Act (PDCA) process model structure	2.9625	1.44817

Source: Field Survey, 2016.

Table 7. Correlation matrix of the dimensions of MSI and measures of organizational performance.

Correlations

		Quality Management	Health and Safety Management	Environment Management	Customer Satisfaction	Organizational Efficiency
Quality Management	Pearson Correlation	1	.619**	.232**	.798**	.846**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	427	427	427	427	427
Health and Safety Management	Pearson Correlation	.619**	1	.199**	.668**	.703**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	427	427	427	427	427
Environment Management	Pearson Correlation	.232**	.199**	1	.316**	.220**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	427	427	427	427	427
Customer Satisfaction	Pearson Correlation	.798**	.668**	.316**	1	.851**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	427	427	427	427	427
Organizational Efficiency	Pearson Correlation	.846**	.703**	.220**	.851**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	427	427	427	427	427

**. Correlation is significant at the 0.01 level (2-tailed).

Source: SPSS ver. 20 Output window.

and obligations to their environment of operations. One of the other reasons for this and the generality of results in this study could be due to effect from company differences: in other words, firms integration of management systems could be different so much so that individual firm correlations in less influential firms is absolved or redundant for each relationship, leaving the influence from only one or two firms to override the total result because of its size. But the question would still be asked, How can oil and gas firms, and indeed, allied sectors be successful in deriving greater benefits from integration. The answer lies in effective oversight by the relevant authorities, which include Federal and State Government during and after integration. This would ensure that entities

embarking on standards integration comply with all directives and guidelines as contained in respective standards.

CONCLUSION

Key issues to organizations are customer satisfaction and efficient utilizations of resources. These can be achieved through an implementation of an effective integrated management system. The standard management systems ISO 9001, ISO 14001, OHSAS 18001 are built on the theory that they can be achieved through implementing and improving organizational activities and behaviour. This means a system's principles and approach can be used throughout the business to provide a framework for managing all organizational standards, regulators and customer contract requirements.

RECOMMENDATIONS

Based on the findings and conclusion drawn thereof, the following recommendations are made:
Organizations should regard these management systems as the way to work – so that they can see it as useful tools for achieving objectives rather than compliance process. Management should also maintain a healthy balance between training and written procedures – if staff is well trained and competent, this is sure to result in high level of organizational performance. One major contribution of this study is to highlight the neglect to environment as indicated in Table 4. Concerted efforts are required to ensure that firms operations do not harm the environment. Future research could look at the difference between extent of integration for each of the management systems as well as between different organizations and sectors.

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